Path-P: Known problems -- solutions

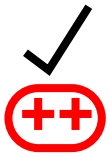
- No retrievals above 1000 m

Soln: Post-doc to modify algorithm

- Clear bias (retrievals with > 90% effective cloud fraction rejected. ~5% of pixels)

Soln: Empirical correction with raobs

- Intersatellite calibration



Soln: (1) Empirical correction
(2) recompute "deltas"

- Bias in precipitable water, different over ice, ocean, land

Soln: Empirical correction (Groves and Francis, 2001)

- Low bias in summer ISTs

Soln: Remove pixels with > 95% cloud fraction

- Cloud retrievals could be better

Soln: Revamp cloud retrieval algorithm

- Advection errors due to Reanalysis winds

Soln: Use TOVS temperature profiles with SLP to generate new upper-level winds data

Arctic Reanalysis: Thoughts and Recommendations

- Must have more data from central Arctic or not worth doing.

  Only source of new info is satellite data. ECMWF already ingests radiances, but biases/problems still exist.

- Make it global. Merge with ERA-40? TOVS Path-A or Path-B?

- Gridded fields vs. orbital swath retrievals

  Space/time averaging reduces noise. EASE grid similar resolution to GCM grid.

- Temporal coverage -- what to do pre-1979? Need funding to process TOVS post-1998.

- Additional parameters possible: P-E, radiation fluxes, advective transport, PBL parameters

- Clouds:

  Use retrievals or let models make their own?

- Winds:

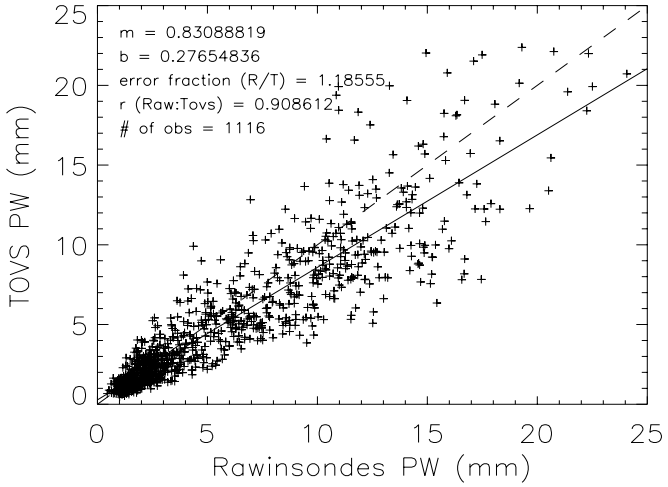
  Will better T(z), q(z) help reanalyses?

- Ice:

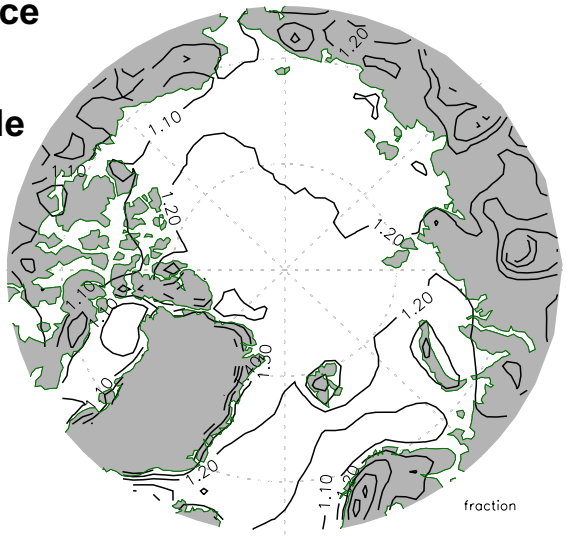
  Use satellite-retrieved ice edges?

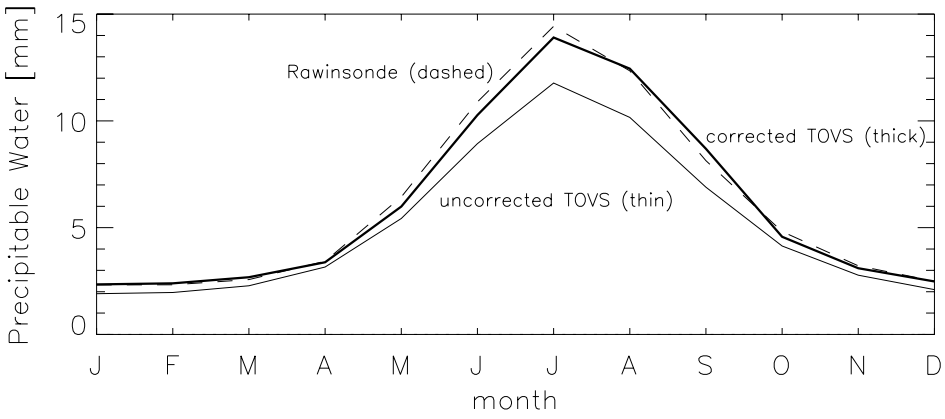
- ISTs?

Path-P precipitable water vs. NP raob data for total column

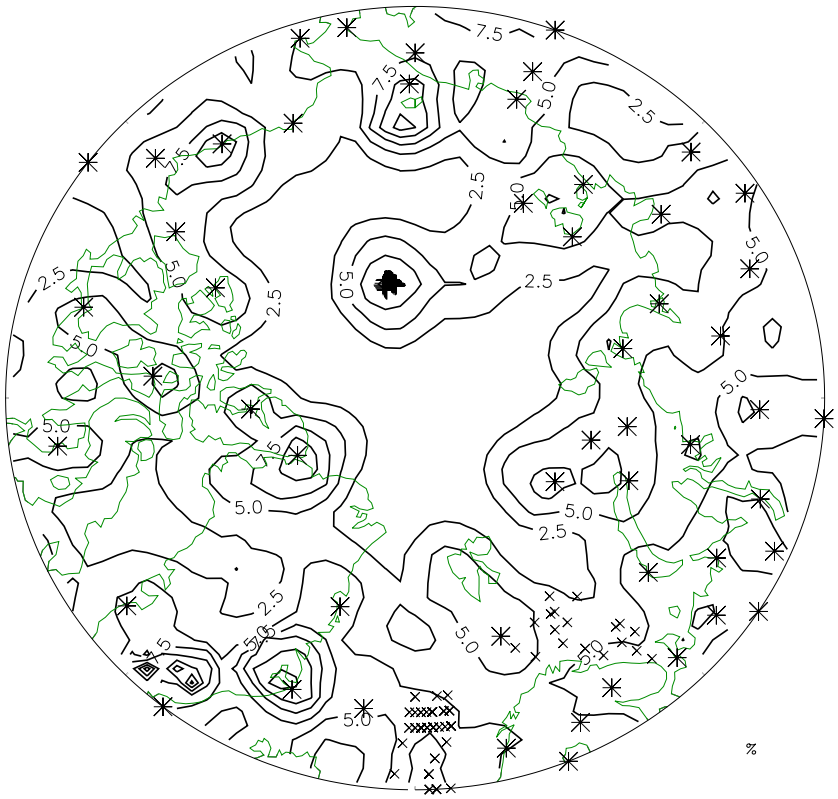


Fractional difference in Path-P vs. NP raob total-column precipitable water



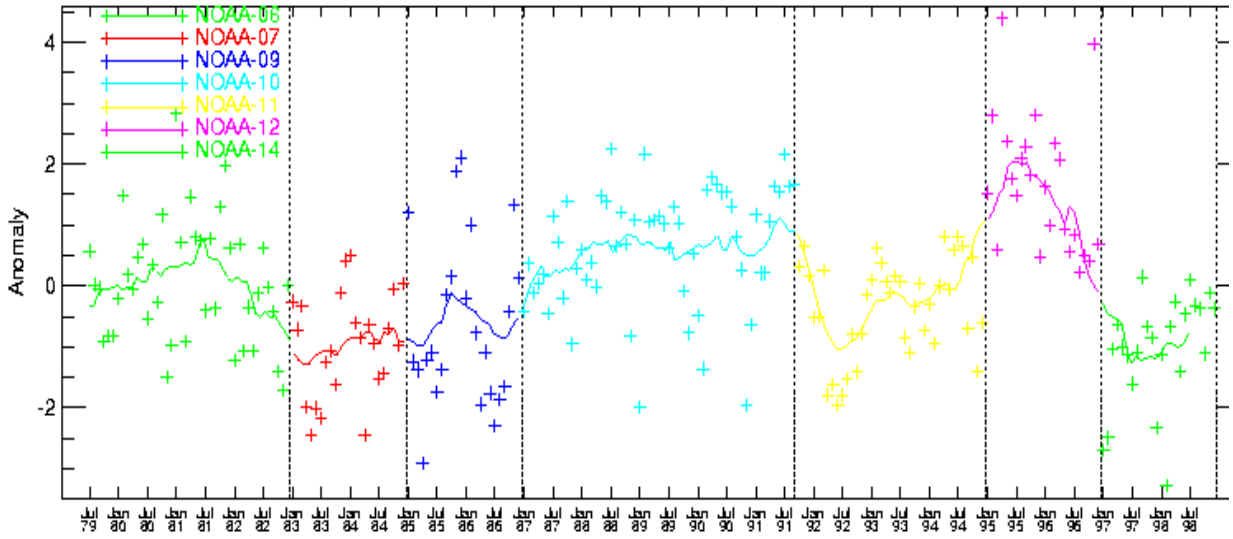


Monthly-mean Path-P PW before and after empirical corrections



Composite map of error magnitude expressed as percent of 6-hourly forecast precipitable water for June, 1985. Plus symbols indicate the positions of Russian ice station NP-26, crosses indicate marine rawinsonde launch locations from the NCEP Marine rawinsonde archive, and the asterisks indicate the location of HARA land-based stations in operation during June, 1985. Contour interval is 2.5%. Error is defined as the forecast value minus the analysis value all over the analysis value times 100%. [From Groves and Francis, submitted]

Path-P Skin Temp. monthly anomalies -- before empirical correction



Path-P Skin Temp. monthly anomalies -- after empirical correction